In the claims:

Please amend the claims to read as follows:

Claims 1 – 28. (Cancelled)

Claim 29 (Currently Amended) A two-stage reactor for removing pollutants from gaseous streams, the two-stage reactor comprising:

a) an upper thermal reaction chamber comprising:

i) an outer exterior wall;

ii) an interior porous wall, wherein the interior porous wall defines a central chamber, and wherein the interior porous wall is positioned from the outer exterior wall a sufficient distance to define an interior space;

iii) at least one waste gas inlet in fluid communication with the central chamber for introducing a gaseous waste stream therein;

iv) a fuel inlet ~~for introduction of~~ adapted to introduce a fuel ~~gas for mixing with the gaseous waste stream~~ into the central chamber, where the fuel inlet is positioned to introduce fuel through a path that does not pass through pores of the porous wall;

v) an oxidant inlet adapted to introduce an oxidant into the central chamber, where the oxidant inlet is positioned to introduce oxidant through a path that does not pass through pores of the porous wall ~~for introduction of an oxidant for mixing with the gaseous waste stream~~;

vi) thermal means for forming reaction products from the gaseous waste stream; and

vii) means for introducing a fluid into the interior space, wherein the interior porous wall provides for transference of the fluid from the interior space into the central chamber at a sufficient force to reduce deposition of reaction products on the interior porous wall; and

b) a lower reaction chamber comprising:

i) a gas flow chamber in fluid communication with the central chamber comprising an inlet and outlet for passing the gaseous waste stream and reaction products therethrough; and

ii) means for generating a downwardly flowing liquid film on interior surfaces of the gas flow chamber thereby reducing deposition and accumulation of particulate solids thereon.

Claim 30 (Previously Presented) The two-stage reactor according to claim 29, wherein the interior space positioned between the outer exterior wall and the interior porous wall is an interior annular space.

Claim 31 (Previously Presented) The two-stage reactor according to claim 30, wherein the means for introducing a fluid into the interior space is adapted to introduce pressurized fluid into the interior annular space.

Claim 32 (Previously Presented) The two-stage reactor according to claim 29, wherein the means for introducing a fluid into the interior space is adapted to introduce fluid selected from the group consisting of water, steam, an inert gas, a heated gas, air, clean dry air, and clean enriched air.

Claim 33 (Previously Presented) The two-stage reactor according to claim 32, wherein the means for introducing a fluid into the interior space is adapted to introduce water.

Claim 34 (Previously Presented) The two-stage reactor according to claim 29, wherein the means for introducing a fluid into the interior space is adapted to introduce fluid into the interior space under pulsing conditions.

Claim 35 (Previously Presented) The two-stage reactor according to claim 34, wherein the means for introducing a fluid into the interior space is adapted to inject fluid into the central chamber under periodic pulsing.

Claim 36 (Previously Presented) The two-stage reactor according to claim 34, wherein the means for introducing a fluid into the interior space is adapted to introduce fluid into the interior space under pulsing conditions using a pulsation duration of from about 3 msec to 1 sec.

Claim 37 (Previously Presented) The two-stage reactor according to claim 29, wherein the lower reaction chamber includes at least one oxidant inlet positioned to introduce an oxidant to the gas flow chamber.

Claim 38 (Cancelled).

Claim 39 (Previously Presented) The two-stage reactor according to claim 29, further comprising a combustible fuel supply coupled to the fuel inlet, wherein the combustible fuel supply is adapted to supply, propane, natural gas, methane or hydrogen.

Claim 40 (Previously Presented) The two-stage reactor according to claim 29, wherein the means for introducing a fluid into the interior space comprises a liquid vortex positioned near the inlet of the gas flow chamber.

Claim 41 (Currently Amended) The two-stage reactor according to claim 40, wherein the liquid vortex comprises:

(i) an outer shell having a top plate, a central opening in fluid communication with the central chamber;

(ii) a conical-shaped baffle within the outer shell having an inner surface and a central opening which is generally aligned with the interior surface of the gas stream flow chamber, the conical-shaped baffle generally concentrically aligned with the inner surface of the outer shell to form a concentric chamber; and

~~(ii)~~(iii) a liquid inlet arranged to tangentially introduce liquid into the concentric chamber, thereby filling the concentric chamber with liquid to create a swirling motion, causing the liquid to rise and overflow the conical-shaped baffle to form a sheet of fluid on the inner surface of the conical-shaped baffle that flows downwardly onto the interior surface of the gas stream flow chamber.

Claim 42 (Previously Presented) The two-stage reactor according to claim 41, wherein the sheet of fluid on the inner surface of the conical-shaped baffle inhibits contact of an entering gas stream with the interior surface of the gas stream flow chamber thereby resisting deposition of reaction products thereon.

Claim 43 (Previously Presented) The two-stage reactor according to claim 29, wherein the interior porous wall is fabricated of a material comprising ceramic, sintered ceramic, sintered metal, porous plastic, porous metal material or a porous polymeric material.

Claim 44 (Previously Presented) The two-stage reactor according to claim 43, wherein the interior porous wall comprises pores uniformly distributed in the porous material.

Claim 45 (Previously Presented) The two-stage reactor according to claim 29, wherein the outer exterior wall and the interior porous wall are separated a sufficient distance to provide an annular space and for distributing a pressured gas for passage through the interior porous wall.

Claim 46 (Previously Presented) The two-stage reactor according to claim 45, wherein the interior porous wall comprises a plurality of apertures for passage of a pressurized gas through the interior porous wall into the central chamber.

Claim 47 (Previously Presented) The two-stage reactor according to claim 30, wherein the means for introducing a fluid into the interior space is adapted to introduce fluid that is compressed to a suitable pressure to facilitate pulsating ejection of the fluid with a force sufficient to reduce particle deposition on the inner surface of the central chamber.

Claim 48 (Previously Presented) The two-stage reactor according to claim 47, wherein the pressure is about 100 psig or less.

Claim 49 (Previously Presented) The two-stage reactor according to claim 46, wherein the plurality of apertures comprises conical shaped protuberances.

Claim 50 (Currently Amended) An abatement system for treating gaseous pollutants in a gaseous waste stream, the system comprising:

a) an upper thermal reaction chamber comprising:

i) an outer exterior wall;

ii) an interior porous wall, wherein the interior porous wall defines a central chamber and wherein the interior porous wall is positioned from the outer exterior wall a sufficient distance to define an interior annular space;

iii) means for introducing a fluid to the interior annular space;

iv) thermal means for forming reaction products from the gaseous waste stream; and

v) at least one waste gas inlet for conducting the gaseous waste stream into the upper thermal reactor;

vi) at least one fuel inlet ~~for introduction of~~ adapted to introduce a fuel ~~gas for mixing with the gaseous waste stream~~ into the central chamber, where the fuel inlet is positioned to introduce fuel through a path that does not pass through pores of the porous wall;

vii) at least one oxidant inlet adapted to introduce an oxidant into the central chamber, where the oxidant inlet is positioned to introduce oxidant through a path that does not pass through pores of the porous wall ~~for introduction of an oxidant for mixing with the gaseous waste stream~~; and

b) a lower reaction chamber comprising:

i) a gas flow chamber in fluid communication with the central chamber; and

ii) at least one oxidant inlet positioned to introduce an oxidant to the gas stream flow chamber.

Claim 51 (Previously Presented) The abatement system according to claim 50, wherein the at least one waste gas inlet comprises a conduit terminating with a portion of the conduit within the central chamber wherein the portion of the conduit is located within a tube which projects beyond the end of the conduit to define a chamber within the tube for flame formation, the tube having an open end communicating with the central chamber.

Claim 52 (Previously Presented) The abatement system according to claim 50, wherein the lower reaction chamber includes a liquid vortex positioned between the central chamber and the gas flow chamber, wherein the liquid vortex comprises:

(1) a outer shell having a top plate, a central opening in fluid communication with the central chamber;

(2) a conical-shaped baffle within the outer shell having an inner surface and a central opening which is generally aligned with the interior surface of the gas stream flow chamber, the conical-shaped baffle generally concentrically aligned with the inner surface of the outer shell to form a concentric chamber; and

(3) a liquid inlet arranged to tangentially introduce liquid into the concentric chamber, thereby filling the concentric chamber with liquid to create a swirling motion, causing the liquid to rise and overflow the conical-shaped baffle into the gas stream flow chamber to form a sheet of fluid on the inner surface of the conical-

shaped baffle that flows downwardly onto the interior surface of the gas stream flow chamber.

Claim 53 (Previously Presented) The abatement system according to claim 50, wherein the interior porous wall provides for transference of the fluid from the interior annular space into the central chamber at a sufficient force to reduce deposition of reaction products on the interior porous wall.

Claim 54 (Previously Presented) The abatement system according to claim 50, wherein the interior porous wall comprises a porosity of about 80% or less.

Claim 55 (Previously Presented) The abatement system according to claim 50, wherein the means for introducing a fluid to the interior annular space is adapted to introduce pressurized fluid into the annular space.

Claim 56 (Previously Presented) The abatement system according to claim 50, wherein the means for introducing a fluid to the interior annular space is adapted to introduce fluid selected from the group consisting of water, air, clean dry air, and clean enriched air.

Claim 57 (Previously Presented) The abatement system according to claim 50, wherein the means for introducing a fluid to the interior annular space is adapted to introduce water.

Claim 58 (Previously Presented) The abatement system according to claim 53, wherein the means for introducing a fluid to the interior annular space is adapted to inject steam through the interior porous wall.

Claim 59 (Previously Presented) The abatement system according to claim 53, wherein the means for introducing a fluid to the interior annular space is adapted to introduce fluid under pulsing conditions.

Claim 60 (Cancelled)

Claim 61 (Previously Presented) The abatement system according to claim 50, further comprising a combustible fuel supply coupled to the at least one fuel inlet, wherein the combustible fuel supply is adapted to supply, propane, natural gas, methane or hydrogen.

Claims 62 - 65 (Cancelled).

Claim 66 (Currently Amended) An apparatus for use during the abatement of a semiconductor manufacturing process comprising:

a thermal reaction chamber having:

an interior porous wall that defines a central chamber;

at least one waste gas inlet in fluid communication with the central chamber and adapted to introduce a gaseous waste stream to the central chamber;

at least one fuel inlet ~~for introduction of~~ adapted to introduce a fuel ~~gas for mixing with the gaseous waste stream~~ into the central chamber, where the fuel inlet is positioned to introduce fuel through a path that does not pass through pores of the porous wall;

at least one oxidant inlet adapted to introduce an oxidant into the central chamber, where the oxidant inlet is positioned to introduce oxidant through a path that does not pass through pores of the porous wall ~~for~~

~~introduction of an oxidant for mixing with the gaseous waste stream~~;

a thermal mechanism positioned within the central chamber and adapted to form reaction products from the gaseous waste stream within the central chamber; and

a fluid delivery system adapted to provide a fluid to the central chamber through the interior porous wall at a sufficient force to reduce deposition of reaction products on an inner surface of the interior porous wall of the central chamber.

Claim 67 (Previously Presented) The apparatus of claim 66 further comprising:

an outer wall that surrounds the interior porous wall and that defines an interior space between the outer wall and the interior porous wall;

wherein the fluid delivery system is adapted to provide a fluid to the central chamber through the interior porous wall by providing fluid to the interior space between the outer wall and the interior porous wall.

Claim 68 (Previously Presented) The apparatus of claim 66 wherein the central chamber is cylindrical.

Claim 69 (Previously Presented) The apparatus of claim 66 wherein the fluid delivery system is adapted to provide water, steam, an inert gas, a heated gas, air, clean dry air or clean enriched air to the central chamber through the interior porous wall.

Claim 70 (Previously Presented) The apparatus of claim 66 wherein the fluid delivery system is adapted to provide fluid to

the central chamber through the interior porous wall by pulsing the fluid.

Claim 71 (Previously Presented) The apparatus of claim 70 wherein the fluid delivery system is adapted to provide fluid to the central chamber through the interior porous wall by periodically pulsing the fluid.

Claim 72 (Previously Presented) The apparatus of claim 66 wherein the fluid delivery system is adapted to provide fluid to the central chamber through the interior porous wall at a pressure of about 600 psig or less.

Claim 73 (Previously Presented) The apparatus of claim 72 wherein the fluid delivery system is adapted to provide fluid to the central chamber through the interior porous wall at a pressure of about 100 psig or less.

Claim 74 (Previously Presented) The apparatus of claim 66 wherein the fluid delivery system is adapted to provide a fluid to the central chamber through the interior porous wall so as to form a non-deposition zone adjacent the interior surface of the central chamber.

Claim 75 (Previously Presented) The apparatus of claim 66 wherein the fluid delivery system includes a plurality of inlets adapted to deliver fluid along a length of an exterior surface of the interior porous wall.

Claim 76 (Previously Presented) The apparatus of claim 66 wherein the interior porous wall includes pores shaped so as to provide passage of fluid into the central chamber while reducing

backflow of any fluid or reaction products from the central chamber.

Claim 77 (Previously Presented) The apparatus of claim 66 wherein the interior porous wall comprises a porous ceramic.

Claim 78 (Previously Presented) The apparatus of claim 77 wherein the interior porous wall includes pores shaped so as to provide passage of fluid into the central chamber while reducing backflow of any fluid or reaction products from the central chamber.

Claim 79 (Previously Presented) The apparatus of claim 66 wherein the thermal reaction chamber includes a plurality of waste gas inlets.

Claim 80 (Previously Presented) The apparatus of claim 79 wherein the thermal reaction chamber includes at least four waste gas inlets.

Claim 81 (Previously Presented) The apparatus of claim 79 wherein the thermal reaction chamber includes at least six waste gas inlets.

Claim 82 (Previously Presented) The apparatus of claim 66 further comprising:

a second reaction chamber coupled to the thermal reaction chamber and having:

a gas flow chamber in fluid communication with the central chamber, the gas flow chamber having an inlet and outlet for passing the gaseous waste stream and reaction products through the gas flow chamber; and

a water delivery system adapted to generate a flowing liquid film on an interior surface of the gas flow chamber so as to reduce deposition and accumulation of particulate solids on the interior surface of the gas flow chamber.

Claim 83 (Previously Presented) The apparatus of claim 82 wherein the water delivery system is adapted to cool the interior surface of the gas flow chamber.

Claim 84 (Previously Presented) The apparatus of claim 82 wherein the water delivery system is adapted to generate a vortex of cooling water.

Claim 85 (Previously Presented) The apparatus of claim 66 wherein the second reaction chamber is located below the thermal reaction chamber.

Claim 86 (Previously Presented) The apparatus of claim 66 wherein the second reaction chamber includes at least one inlet adapted to introduce an oxidant to the gaseous waste stream.

Claim 87 (Currently Amended) An apparatus for use during the abatement of a semiconductor manufacturing process comprising:

an upper reaction chamber having:

an interior porous wall that defines a central chamber;

an outer wall that surrounds the interior porous wall and that defines an interior space between the outer wall and the interior porous wall;

at least one waste gas inlet in fluid communication with the central chamber and adapted to introduce a gaseous waste stream to the central chamber;

at least one fuel inlet ~~for introduction of~~ adapted to introduce a fuel ~~gas for mixing with the gaseous waste stream~~ into the central chamber, where the fuel inlet is positioned to introduce fuel through a path that does not pass through pores of the porous wall;

at least one oxidant inlet adapted to introduce an oxidant into the central chamber, where the oxidant inlet is positioned to introduce oxidant through a path that does not pass through pores of the porous wall ~~for introduction of an oxidant for mixing with the gaseous waste stream~~;

a thermal mechanism positioned within the central chamber and adapted to form reaction products from the gaseous waste stream within the central chamber; and

a fluid delivery system adapted to provide a fluid to the central chamber through the interior porous wall at a sufficient force to reduce deposition of reaction products on an inner surface of the interior porous wall of the central chamber; and

a lower reaction chamber coupled to the upper reaction chamber and having:

a gas flow chamber in fluid communication with the central chamber, the gas flow chamber having an inlet and outlet for passing the gaseous waste stream and reaction products through the gas flow chamber;

a water delivery system adapted to generate a flowing liquid film on an interior surface of the gas flow chamber so as to reduce deposition and accumulation of particulate solids on the interior surface of the gas flow chamber; and

at least one inlet adapted to introduce an oxidant to the gaseous waste stream.

Claim 88 (Previously Presented) An apparatus comprising:

a porous ceramic wall having a shape that defines a central chamber for use during formation of reaction products from gaseous waste from a semiconductor manufacturing process, the porous ceramic wall having sufficient porosity to allow transfer of fluid from outside the porous ceramic wall through the porous ceramic wall and into the central chamber during formation of reaction products within the central chamber so as to reduce movement of reaction products toward an interior surface of the porous ceramic wall, wherein the porous ceramic wall includes pores shaped so as to provide passage of fluid into the central chamber defined by the porous ceramic wall while reducing backflow of any fluid or reaction products from the central chamber.

Claim 89 (Cancelled)

Claim 90 (Previously Presented) The apparatus of claim 88 wherein the porous ceramic wall comprises sintered ceramic.

Claim 91 (Previously Presented) The apparatus of claim 88 wherein the porous ceramic wall comprises $MgAl_2O_4$, Al_2O_3 or SiC.

Claim 92 (Cancelled)

Claim 93 (Cancelled)

Claim 94 (New) A two-stage reactor for removing pollutants from gaseous streams, the two-stage reactor comprising:

a) an upper thermal reaction chamber comprising:

i) an outer exterior wall;

ii) an interior porous wall, wherein the interior porous wall defines a central chamber, and wherein the interior porous wall is positioned from the outer exterior wall a sufficient distance to define an interior space, and wherein the interior space does not contain a fuel;

iii) at least one waste gas inlet in fluid communication with the central chamber for introducing a gaseous waste stream therein;

iv) thermal means for forming reaction products from the gaseous waste stream; and

v) means for introducing a fluid into the interior space, wherein the interior porous wall provides for transference of the fluid from the interior space into the central chamber at a sufficient force to reduce deposition of reaction products on the interior porous wall; and

b) a lower reaction chamber comprising:

i) a gas flow chamber in fluid communication with the central chamber comprising an inlet and outlet for passing the gaseous waste stream and reaction products therethrough; and

ii) means for generating a downwardly flowing liquid film on interior surfaces of the gas flow chamber thereby reducing deposition and accumulation of particulate solids thereon.